

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington DC 20554**

In the Matter of)	
)	
Facilitating Shared Use in the 3100-3550)	WT Docket No. 19-348
MHz Band)	
)	

COMMENTS OF THE CBRS ALLIANCE

The CBRS Alliance (“CBRS Alliance”), submits these comments in the above-captioned proceeding.¹

I. INTRODUCTION

The CBRS Alliance is an industry organization focused on driving the development, commercialization, and adoption of shared spectrum solutions. CBRS Alliance represents nearly 200 companies who believe that 3GPP technology-based solutions in the CBRS band, specifically LTE and 5G, utilizing shared spectrum, can enable both in-building and outdoor coverage and capacity expansion at massive scale. In order to maximize the full potential of CBRS, the CBRS Alliance aims to enable a robust ecosystem towards making 3GPP-based CBRS solutions available. The mission of the CBRS Alliance is to evangelize 3GPP-based CBRS technology, use cases and business opportunities while simultaneously driving technology developments necessary to fulfill the mission, including multi-operator LTE or 5G capabilities. CBRS Alliance will also establish an effective product certification program for LTE equipment in the US 3.5 GHz band ensuring multi-vendor interoperability.

¹ *Facilitating Shared Use in the 3100-3550 MHz Band*, WT Docket No. 19-348, Report and Order and Further Notice of Proposed Modification, 35 FCC Rcd 11078 (2020) (“FNPRM”).

CBRS Alliance welcomes the opportunity to provide these comments on the FNPRM that could add 100 MHz (and up to 450 MHz) of highly desirable spectrum to the mid-band pool. This represents critical mid-band spectrum that is crucial in maintaining U.S. leadership in telecommunications. Nonetheless, there are important sharing issues, both within the 3.45-3.55 GHz band and adjacent to the band considering CBRS that must be considered as detailed below.

II. CBRS ALLIANCE SUPPORTS MAKING THE 3.45~3.55 GHZ BAND AVAILABLE

CBRS Alliance commends the White House and the DoD for establishing America's Mid-Band Initiative Team ("AMBIT") and moving quickly to identify more spectrum in the 3.45-3.55 GHz band for 5G services and beyond. We applaud the Commission for expediting the rulemaking process to advance America's 5G competitiveness.

Meeting the demand for 5G services requires large amounts of spectrum, particularly in the mid-band. Mid-band spectrum is of course recognized for its ideal balance of coverage and capacity. The 100 MHz of spectrum from 3.45-3.55 GHz is an important addition to mid-band spectrum availability in the United States.

The 3.45-3.55 GHz band is part of a globally harmonized band for 5G, designated by 3GPP as the n77 band, encompassing 3.3-4.2 GHz. Further aligning with that global assignment will allow the United States to take advantage of global standards. As a proponent of 3GPP based technologies, CBRS Alliance supports the adoption of rules that enable the United States to align with mid-band efforts in other countries and participate in the rapidly growing market for mobile technology.

Globally harmonized spectrum and operating rules have many advantages. The Global mobile Suppliers Association ("GSA") recently observed, "[t]he mobile industry always seeks globally harmonized spectrum allocations since such harmonization invariably results in a broader

ecosystem for technology, equipment, and engineering expertise, leading to economies of scale, lower costs for deployment, and more rapid roll-out of new services.”²

Lastly, the CBRS Alliance welcomes the Commission’s directive in the FNPRM to explore ways to share additional spectrum in the remainder of the 3.1-3.55 GHz band and to make 100 megahertz of spectrum between 3.35 and 3.45 GHz available for commercial use.³ This will facilitate the larger channel bandwidths (on the order of 100 MHz) necessary to sustain a variety of 5G use cases. CBRS Alliance is more than willing to provide relevant experience from the CBRS band to help achieve this end.

III. CLEARING THE 3.45-3.55 GHZ BAND OF FEDERAL OPERATIONS SHOULD NOT NEGATIVELY AFFECT THE CBRS BAND

The principal incumbent radar in the CBRS band is the shipborne SPN-43 air traffic control radar, which operates in the 3500-3700 MHz range. However, shipborne radar use in the 3650-3700 MHz range is not allowed within 44 nautical miles of the coast, so the predominant use of the SPN-43 in the waters closest to the U.S. is in the 3500-3650 MHz range. The bottom 50 MHz of the SPN-43 operating range overlaps the 3.45-3.55 GHz band which is being proposed for the 3.45 GHz Service. The top 100 MHz of the SPN-43 operating range covers the CBRS band at 3550-3650.

As part of its effort to make the 3.45-3.55 GHz band available for commercial service, the DoD intends to “modify its concept of operations” within the band.⁴ The exact meaning of this phrase is not defined. Regarding the SPN-43, if the phrase means that the SPN-43 will no longer be used in the 3500-3550 MHz range, will this be achieved by using radars that operate entirely

² Global Mobile Suppliers Association White Paper, “3300-4200 MHz: A Key Frequency Band for 5G,” at 4 (2020) (“GSA 5G White Paper”).

³ R&O and FNPRM ¶19.

⁴ FNPRM at ¶12.

outside of the 3 GHz range? Or will the SPN-43 simply be “locked out” of the 3500-3550 MHz tuning range and continue to operate in the remainder of its band? If the latter, and if the same amount of SPN-43 activity is expected to occur, that would mean that there would be increased use of the SPN-43 in its remaining tuning range, i.e., within the CBRS band. For example, if activity that is currently spread uniformly across the 150 MHz of the 3500-3650 MHz range is compressed into the 100 MHz of the 3550-3650 MHz range (to vacate 3500-3550 MHz), that that would result in a substantial increase in radar activations in the PAL licensed portion of the CBRS band caused by the SPN-43, which is the most prevalent radar in the band.

CBRS Alliance is very concerned about the implications of the clearing of 3450-3550 MHz at the expense of increased incumbent activity in the CBRS band. We urge the DoD, NTIA, and FCC to clarify the extent to which SPN-43 (or any other existing or new system) moving out of the 3450-3550 MHz band may result in an increase in protected incumbent activity in the portion of the CBRS band available for PAL operations.

IV. **BASED ON THE POTENTIAL FOR ADJACENT-BAND INTERFERENCE FROM 3.45-3.55 GHZ OPERATIONS ON CBRS, WE SUGGEST THE COMMISSION CONSIDER THE NEED FOR COORDINATION OR NOTIFICATION**

The interference situation at the 3550 MHz boundary between CBRS and the 3.45 GHz Service is similar to the interference situation between CBRS and the 3.7 GHz Service at the mutual 3700 MHz boundary (see Figure 1 below). The potential for significant interference between CBRS

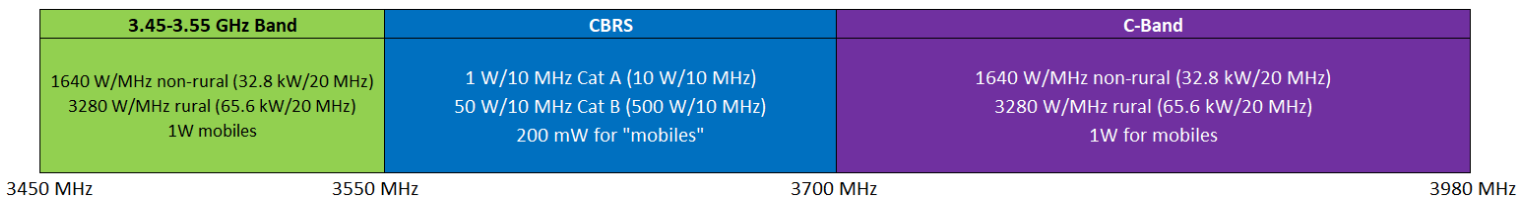


Figure 1: 3 GHz Bands

systems and high-power 3.7 GHz Service systems at the 3700 MHz boundary between the two

services has been well established. The CBRS Alliance notes that other industry trade organizations such as NCTA⁵ and WISPA⁶, representing many hundreds of companies from a variety of sectors, have filed letters expressing concerns about the impact of future 3.45-3.55 GHz operations to the adjacent CBRS band. In addition, we reiterate our comments that “The Commission should address industry coordination around these types of issues at the 3550 MHz band edge in any proceeding.”⁷

This is partly due to the fact that 3.7 GHz Service base stations can radiate as much as 28 dB (650x) higher power spectral density than CBRS base stations. This could have a substantial impact to lower frequency range of CBRS – the band where auction bidders spent almost \$4.6 billion for Priority Access Licenses (PALs).

An industry multi-stakeholder group has conducted a study, recently filed at the Commission, that notes that interference over distances of more than 1 km may occur, although the impacts are entirely situation-dependent and could be better or worse.⁸ The study concludes that TDD synchronization can help in many situations, although not all systems can be synchronized, and synchronization generally requires the operators to use the same uplink/downlink fraction, and therefore be supporting similar use cases. In short, there is no panacea to the potential interference that may occur at the frequency boundary. While commenters noted the potential for harmful interference⁹, so far, the Commission has declined to adopt any rules to address interference into the CBRS band.¹⁰

The same situation would occur at the 3550 MHz boundary between the 3.45 GHz band and the

⁵ NCTA letter, WT 19-348, October 26, 2020..

⁶ WISPA letter, WT 19-348, September 17, 2020

⁷ CBRS Alliance letter, WT 19-348, September 31, 2020.

⁸ <https://ecfsapi.fcc.gov/file/1012676927498/C-Band%20TWG4%205G-CBRS%20Coexistence%20Cover%20Letter%20and%20Report%202020-10-12.pdf>

⁹ See Charter Communications, Inc. Petition for Reconsideration, [https://ecfsapi.fcc.gov/file/10527106958674/Charter%20C-Band%20Petition%20for%20Recon%20\(5-26-20\).pdf](https://ecfsapi.fcc.gov/file/10527106958674/Charter%20C-Band%20Petition%20for%20Recon%20(5-26-20).pdf)

¹⁰ FNPRM at ¶¶396-397.

CBRS band. The proposed power limits for the 3.45 GHz Service are the same as those proposed for the 3.7 GHz Service (i.e., 28 dB greater than CBRS). We believe it is important that the Commission consider proactive steps to help mitigate harmful interference in this case. We believe the Commission should recommend that 3.45 GHz Service and CBRS operators (and affiliated SAS Administrators) coordinate in good faith when and if there is clear evidence of harmful interference to either system.

In order to maximize the spectral efficiency and value of both 3.45-3.55 GHz and CBRS operations, CBRS Alliance also strongly supports a coordination process for TDD configurations between adjacent users at the 3550 MHz band edge. The SAS and related Coexistence Manager components could be employed to facilitate this coordination for the CBRS operations and could potentially be expanded to accept inputs on TDD parameters from the 3.45-3.55 GHz operations as well. While the FNPRM notes that the Commission did not require synchronization or coordination for the 3.7 GHz Service, the reality is that this omission has resulted in a best effort approach from stakeholders, which relies upon all participants voluntarily acting for the greater good, possibly at the expense of the optimal configuration supporting their own particular service requirements. Given the significant impacts from uncoordinated operations, CBRS Alliance suggests that the Commission should work with stakeholders to facilitate coordination between the 3.45 GHz Service and CBRS.

Even more critically, the Commission must adopt prior coordination rules between 3.45 GHz Service operators and CBRS Environmental Sensing Capability (ESC) operators. ESCs employ sensitive receiving devices that cover the range 3550-3650 MHz in order to detect incumbent federal government radar systems. The sensors must be protected down to low levels of aggregate interference so that the sensors can detect potentially faint radar signals from offshore. When the

sensors detect a radar, they alert SASs that incumbent activity is occurring, and the SASs reconfigure CBRS devices in the area so that harmful interference to incumbent systems won't occur. If the sensors themselves receive interference above a pre-determined level, the sensors must report a fault condition and automatically assume that radar activity is occurring (i.e., the sensors are required to "fail safe"). This can cause substantial CBRS outages out to potentially hundreds of kilometers inland in order to protect very likely non-existent incumbent activity.

At the 3700 MHz boundary, there is 50 MHz of guard band between the ESC sensor band (3550-3650 MHz) and the high-power 3.7 GHz Service, so we believe interference may be manageable (although this has yet to be verified). However, at the boundary with the 3.45 GHz Service, there is no guard band between ESC sensors' receive band edge and potentially high-power 3.45 GHz Service base stations. For this reason, filters will have no appreciable effect, and 3.45 GHz Service transmissions may exceed the ESC sensor protection criteria out to significant distances. Without prior coordination, the interference will begin as soon as the 3.45 GHz Service base station is turned on, and disruption of CBRS service will not cease until either the base station is turned off or the ESC operator is able to relocate its sensor to a different site. And, without prior coordination, there's no guarantee that a new 3.45 GHz Service base station won't interfere in the future with the new ESC sensor site.

CBRS Alliance believes the potential for 3.45 GHz Service transmitters to cause interference to ESC sensors is sufficiently real and serious and we urge the Commission to consider rules to avoid this situation. CBRS Alliance suggests the Commission work with industry participants to study the impact of 3.45 GHz service transmitters to ESC sensors through modeling of the ESC sensors in collaboration with ESC operators. Any possible mitigations accorded by planning techniques such as base station antenna tilting and the use of advanced antenna systems should be considered in

addition to coordination with ESC operators. As detailed in the following section, CBRS Alliance hopes that introducing the Incumbent Informing Capability (IIC) being considered for 3.45 GHz band may ultimately result in reducing reliance or eliminating entirely the need for ESC in the CBRS band.

V. WE STRONGLY SUPPORT AND URGE THE QUICK DEVELOPMENT AND ROLL OUT OF THE INFORMING INCUMBENT CAPABILITY INITIALLY FOR 3.45-3.55 GHZ, AND AS APPLICABLE FOR CBRS.

As noted above, both the Commission and NTIA have mentioned the IIC in the context of informing commercial licensees of the DoD's need to operate in CPAs and PUAs as well as during times of national emergency. CBRS Alliance strongly supports the quick development and roll out of an IIC to inform commercial licensees of the DoD's need to take back spectrum. Accordingly, we strongly urge the Commission not to consider the use of a sensing approach such as the ESC that has been deployed for CBRS.

CBRS necessitated sharing directly with DoD radar systems in the 3550-3650 MHz band, directly above the 3.45-3.55 GHz band. This has been accomplished by deploying an extensive network of sophisticated and sensitive coastal radar detectors, which together are the ESC.

While the ESC approach is a workable way to detect radars and avoid interference, it is not optimal. One of the inherent drawbacks of the ESC concept is the interference protection required by the sensors due to anything else operating in the sensors' detection band. ESC sensors must be protected from interference due to CBRS devices and this protection requirement gives rise to zones around each sensor known as "whisper zones" where CBRS devices must be further managed to not interfere with ESC sensors. Indeed, the Commission asks in the FNPRM whether proposed EIRP for the 3450 MHz band would impact ESC sensors in the CBRS band and, if so, what effect

this could have for access to the lower 100 megahertz of the CBRS band.¹¹

Consequently, CBRS Alliance urges the DoD and NTIA to commit to development and quick roll out of an IIC for the 3.45 GHz band, and also extending it to the CBRS band, therefore obviating the need for ESC (with its attendant drawbacks) in both bands. As noted above, the IIC is similar to the AWS portals already in use except that these portals are used to let commercial spectrum users inform federal users of their proposed operation. We also suggest that the DoD and NTIA work with commercial stakeholders to design, develop, test and introduce the IIC as quickly as possible. In addition, the IIC should become a program of record at the NTIA and should be funded accordingly. CBRS Alliance is willing to help with SME support, requirements, test cases, testing, etc.

We also note that informing commercial licensees of DoD operations through the IIC is only part of the process of interference protection. There needs to be a mechanism for systems operating in the 3450 MHz band to reconfigure in the event of an IIC notification. Indeed, one approach to react to these notifications dynamically could be for an IIC to interface dynamically with the 3.45 GHz network through an active spectrum management approach as defined for CBRS. However, we suggest that reconfiguration of commercial systems under these circumstances should be discussed by all stakeholders in the context of the collaborations mentioned above.

CBRS Alliance also suggests that to the extent the IIC can be deployed in the 3450-3550 MHz band in lieu of using an ESC-like sensor network, the Commission should also consider applying the concept retroactively to the CBRS band, thereby reducing or eliminating reliance on the CBRS ESC.

¹¹ FNPRM at ¶ 73.

VI. CONCLUSION

The 450 MHz of spectrum in the 3100-3550 MHz band, and especially the 100 MHz of spectrum in 3.45-3.55 GHz band, represent critical mid-band spectrum that is crucial in maintaining U.S. leadership in telecommunications. The CBRS Alliance encourages the Commission and the wireless industry to move ahead swiftly in making this spectrum available for next-generation wireless services. However, it is imperative that the sharing, coordination, and service rules for these frequencies are optimized for both the existing federal operations and the new commercial operations. It is also necessary to view each of these sub-bands in the overall context of 3 GHz and ensure that inter-band impacts do not degrade the utility of this strategic mid-band spectrum.

Respectfully submitted,

/s/ Dave Wright

Dave Wright
President

November 20, 2020